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INFANT MORTALITY.

REPORT

OF THE

PUBLIC WELFARE COMMITTEE

OF ESSEX COUNTY

1912

665 Broad Street
Newark, N. J.

By Transfer
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HB 1323
I4 E8

“Where the white hearse goes most often, there you will find the weakest places in your municipal housekeeping.”

“A baby who comes into the world has less chance to live one week than an old man of ninety; and less chance to live a year than one of eighty.”

“Infant mortality is an infinitely complex problem.”

“The reduction of infant mortality is a public health problem.”

“The time to save the baby is before it becomes sick, not afterward.”

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*Special report of the work carried on by the
Public Welfare Committee of Essex County
for the
Reduction of Infant Mortality in Newark
together with
A study of the problem in Essex County and
a program for the City of Newark.*

By
JULIUS LEVY, M. D.

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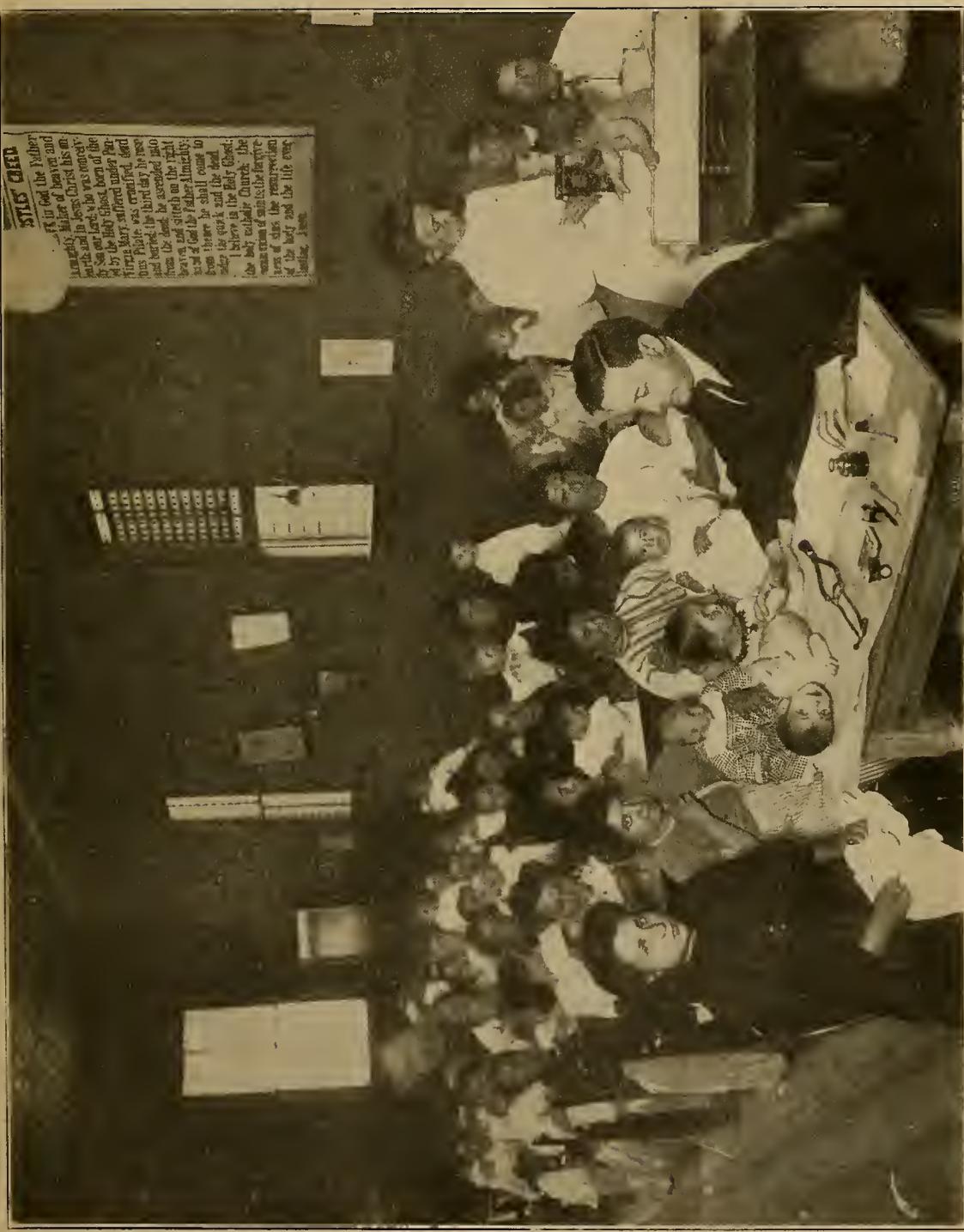
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INTRODUCTION

The purpose of this report is, first, to present a record of the Infant Mortality problem in Essex County, and more especially in Newark, with a study of some of the most important underlying causes; second, to state what has been learned and accomplished by the plan proposed by the Public Welfare Committee of Essex County, providing for infant consultation stations, the education of mothers, and the home modification of milk; third, to propose on the experience obtained here and elsewhere a plan of action commensurate with the complexity of the problem under consideration, a plan that, if properly carried out, will practically remove the infant mortality problem from private charity and philanthropy, and place it on a permanent and efficient basis.

I wish to take occasion here to thank the doctors and nurses who have assisted me in the clinics and have worked so devotedly in the interests of the mothers and their babies; also those who by their financial aid and encouragement have made this experiment and study possible.

FOREWORD.

Of course you believe in *conserving child life!*

This study and report is sent to you in an effort to transmute that belief into action.

Is it too much to ask, in the name of the babies of the county, that little of your time needed for a careful reading?

Be warned, at the outset that such a reading will pull at your heart-strings—and perhaps at your purse-strings.

We owe the study and report especially to the now long continued work, in self-sacrificing spirit of service, of Dr. Julius Levy and to Mr. Edward Blau, Chairman of the committee directly in charge of the work described.

The conclusion reached, that the problem of infant mortality can be most efficiently and economically met by establishing public departments of child hygiene with broad but definite functions is that to which practically all have been forced, who have studied the problem.

What of the time that must pass before the work is included among governmental functions, and public departments of child hygiene become an actuality?

Can we in the meantime turn a deaf ear to the bitter cry of the children? No!

The infant consultation stations now established must be maintained; their work must be strengthened; their number must be increased, and their sphere of activity extended; the continued sale of pure milk, especially for babies, at prices within the reach of those who are compelled to struggle to make wage and outlay meet, must be assured; visiting of the homes of the new-born and the education of the mothers must go on; registration for wet-nurses, and homes must continue to be provided; and the systematic training of midwives must be undertaken.

Then, too, the gathering and study of data must go on.

The campaign of education to create sentiment for the work as a governmental function must be pressed.

So long as the work continues on the plane of private philanthropy appeal must be made to the people for financial aid.

The appeal is now made to you.

The study and report present facts and the results of a scientific study of the facts.

This foreword may serve to re-enforce the heart interest of these facts.

Won't you as you turn the last page look into the beaming faces of your little ones; then think of the little ones outside, and the homes unnecessarily saddened by the going out of the vital spark of some babe's life for want of a little knowledge; for lack of the methods of care which that little knowledge would induce?

And then—**GIVE!**

PUBLIC WELFARE COMMITTEE OF ESSEX COUNTY,

FRANK H. SOMMER,
Chairman.

Wiss Building,

Broad Street, Newark, N. J.

*THE WORK OF THE PUBLIC WELFARE COMMITTEE OF ESSEX COUNTY FOR THE REDUCTION OF INFANT MORTALITY.

The Public Welfare Committee of Essex County has taken up the infant mortality problem in the same spirit that it has studied other civic and social problems in our county, with the same purpose to obtain first hand knowledge of the problem as it exists in our county, to become familiar with the adequacy and efficiency of existing activities and then, if it seems necessary, to evolve a plan and method of solution that will attempt to be commensurate with the problem and can be given permanence by adoption into some municipal department.

With this view in mind we attempted to demonstrate the efficiency of our plans in but limited areas, leaving the extension of the work to the day when the city shall take it over.

Our survey of the infant mortality problem in Newark revealed the following facts:

Infant mortality problem of greatest magnitude.

During the past decade there were more deaths from infants under one year of age than from tuberculosis in all forms and at all ages. That is why the Section on Health of the Public Welfare Committee felt called upon to devote itself to this subject.

Ignorance is greatest single cause.

While it was found that the greater part of these deaths occurred in about four districts, the clinics, hospitals, milk depots were often not in the centre of these districts and therefore not where they could do the greatest amount of good.

Certified milk and milk depots reach only a small percentage of the babies. Diarrhea increasing.

It was found, further, that the doctors and nurses usually could not speak the language of the mothers, and so at best could have very little effect in eliminating what, I believe, is the greatest single factor in this problem—ignorance made hide-bound by prejudice.

It was further found that, though modified milk could be obtained at a milk depot, relatively very few mothers could avail themselves of it on account of the distance, and though certified milk has been sold here for more than fifteen years, practically all of the mothers in the districts of highest mortality were buying very filthy store or bottle milk. The one fact, however, that was the most astounding of all, was that while there has been a reduction of infant mortality in Newark during the past ten years, and though certified milk has been introduced and a milk depot operated, the infant mortality from diarrheal diseases showed a very marked increase in the first half of the past decade and was actually higher at the end of the decade than at the beginning. The reduction of infant

* Paper read before the Pediatric Section of the Academy of Medicine of Northern New Jersey, October, 1912, by Dr. Julius Levy.

mortality has been due to factors not directly influenced by milk supply and feeding.

As a result of these and other studies and observations, we were convinced that milk is not the greatest single factor in the infant mortality problem and that the distribution of modified milk is not the way to solve this complex problem. Indeed, I have long felt—and many other workers are voicing this same opinion—that the milk depot, in the first place, increases the number of artificially fed, and secondly, does not reach the infants that require it most—those with the most ignorant and indifferent mothers; nor indeed when the mortality among infants is highest—before the third month of life.

Our plan found its basis in the common knowledge, obtained both empirically and biologically, that mothers' milk is the only proper food for infants; that mothers can nurse their infants successfully in greater numbers and for longer periods than obtains to-day—that the failure to nurse wholly or partly is due, in large part, to ignorance, inherited prejudices and superstitious beliefs that are fostered by anxious grandmothers, ignorant midwives, and I am sorry to admit, indifferent doctors; in a lesser degree to the equally preventable social and economic conditions of overwork, undernourishment, tuberculosis and other debilitating diseases. Our plan is nothing more than to try to induce mothers to accept our knowledge of the importance of maternal nursing and its *rationale*, of the hygiene of infancy; of the importance of obtaining a clean tuberculin tested milk and then taking proper care of it in the home. Our method has for its fundamental thought that mothers can only be convinced of these somewhat recently emphasized facts by doctors and nurses who see the mothers frequently, know their customs, habits, and prejudices, speak their language—yes, and even their dialect. Our ultimate purpose is to conduct our work in such a manner that the public and the authorities will be convinced that infant welfare work is of such value and importance to the entire community that it shall become a part of the municipal activity for the conservation of public health.

I will describe the work as carried out at one consultation station:

As the district in which this station was opened was inhabited almost entirely by Italians, we obtained, after much difficulty, an Italian doctor and nurse to assist in the work. I wish to state that neither had any special training in pédiatric work. I consider the ability to speak the language of the mother of most importance. Clinics were held twice a week, but the nurse was at the station every day at a certain hour to meet any mothers who wished additional information or had very sick babies. To enable mothers to

Milk is not the greatest single factor.

Maternal nursing and education are the two most important factors in prevention.

Doctor and nurse must speak native language of mother.

Pure milk at reasonable price.

obtain milk fit for infants at a reasonable price, arrangements were made with two milk companies to sell their nursery milk at nine cents a quart, one selling it from drug stores through the generous assistance of the druggists, and the other delivering it by wagon.

Birth records.

After a little persuasive reasoning with the authorities we were permitted to copy the birth records, and with these in our possession our nurses were able to call on every baby in our district before it was two months and in most instances before it was one month old. The purpose of this early visit is to reach the mother while she is still nursing her infant, to explain the danger of giving anything in addition, to advise the mother to come to the station, have her baby weighed each week, and place herself under the direction of the doctor. The doctor bent all his efforts to convince the mothers that they were nursing successfully and that under no circumstances should they give anything to the baby without first consulting him. This constant emphasis on the ability of the mothers to nurse their infants is absolutely necessary to counteract the general impression that very few mothers can nurse their infants successfully for more than a few weeks or months, an idea for which the constant emphasis on milk modifications is partly responsible.

Practically all mothers can nurse their infants.

The time comes when the infant requires additional milk. We then introduce slowly one, two, or three bottles, always prolonging the maternal nursing as long as possible. Even when it seemed that the mother had very little milk and that she could not nurse successfully—which was much less frequently than the mothers claimed, and even than many doctors think—we did not wean, but ordered supplemental feeding, that is, that the baby be nursed every three hours and be given immediately in addition a bottle of milk. In this way we kept continually before the mothers our horror of artificial feeding and our faith in the wonderfully saving powers of their own nourishment. In this way I hope we will re-establish in the breasts of the mothers that faith in their powers and that high sense of duty to their infants' welfare that will compel them to maternal nursing even though it be at the price of some social or physical disability—the lacteal secretion, I am convinced, is usually present. However, some babies must be artificially fed. Of course, all milk was modified at the home of the mothers by the mothers themselves. This may seem very remarkable indeed to some, but I assure you there is no difficulty where the method is simple, the instructions definite, a clean milk to hand, and the cases followed by doctor and nurse that speak the language of the mother. With the exception of a very few cases we required nothing but raw diluted whole milk, cane sugar, barley water and salt. This I would emphasize as the most impressive and important phase

All mothers can be taught to modify milk at home.

of our work, because in this way alone, it seems to me, can rational, intelligent milk modification come into general household and general professional knowledge, can mothers and doctors learn the cost of clean milk, its value and where to obtain it. The mothers obtain a working knowledge of an infant's capacity and digestion, and when they act without advice they will at least have some experience to guide them. In this work of home modification the emphasis is laid on clean milk, clean bottles and nipples, proper intervals, the avoidance of additional food, and not on the modification. Doctors and mothers must be weaned from the superstition that milk modification is so complex a procedure, even when most scientific, that only a baby specialist can understand it and only a trained nurse prepare it.

Naturally, we have some grave cases of malnutrition, marasmus and summer diarrhea brought to us. All these cases have been cared for in the homes of the mothers, by the mothers with the active supervision of the doctor and nurse. We were prompted to try this not only because infants under one year and suffering from nutritional disorders do very badly in all institutions, the mortality often rising to 30 or 40 per cent. in hospitals, and from 60 to 70 per cent. in infant asylums, and even in the worst types of cases is only 23 per cent. in private homes, but mainly because the experience of handling a sick infant has such a great educational value for the mother.

From time to time young infants are left without a mother to care for them either through death, sickness which necessitates the removal of the mother to the hospital, or economic conditions which take the mother to the shop. The first condition we have tried to meet by the establishment of a county registry for the supervision of and placing out of infants. The second condition by trying to explain to the hospitals that by admitting a nursing mother without her infant they are increasing sickness and death; I am glad to say that our hospitals have agreed to admit babies with their nursing mothers. The economic necessity that separates mother and infant is a bit of shortsighted social and economic policy that must cease, whether it be accomplished by means of pensions, insurance, or an entire change of government.

The above are the most important things we have tried to introduce this summer. We intend to continue this work for a time, but in addition we hope to establish classes for expectant mothers to teach them personal hygiene, for mothers to teach them the care of the home and their children, for the little mothers who are often the caretakers of the infants and always have great influence in the home; classes and training for midwives, but only with the purpose of showing the way to the educational and health departments so

Private homes
preferred to
hospitals and
asylums.

Pensioning of
mothers.
Placing out of
infants.

Education of little
mothers, mothers
and midwives.

that this work will be included in their activities. I will submit only a few of our statistical data:

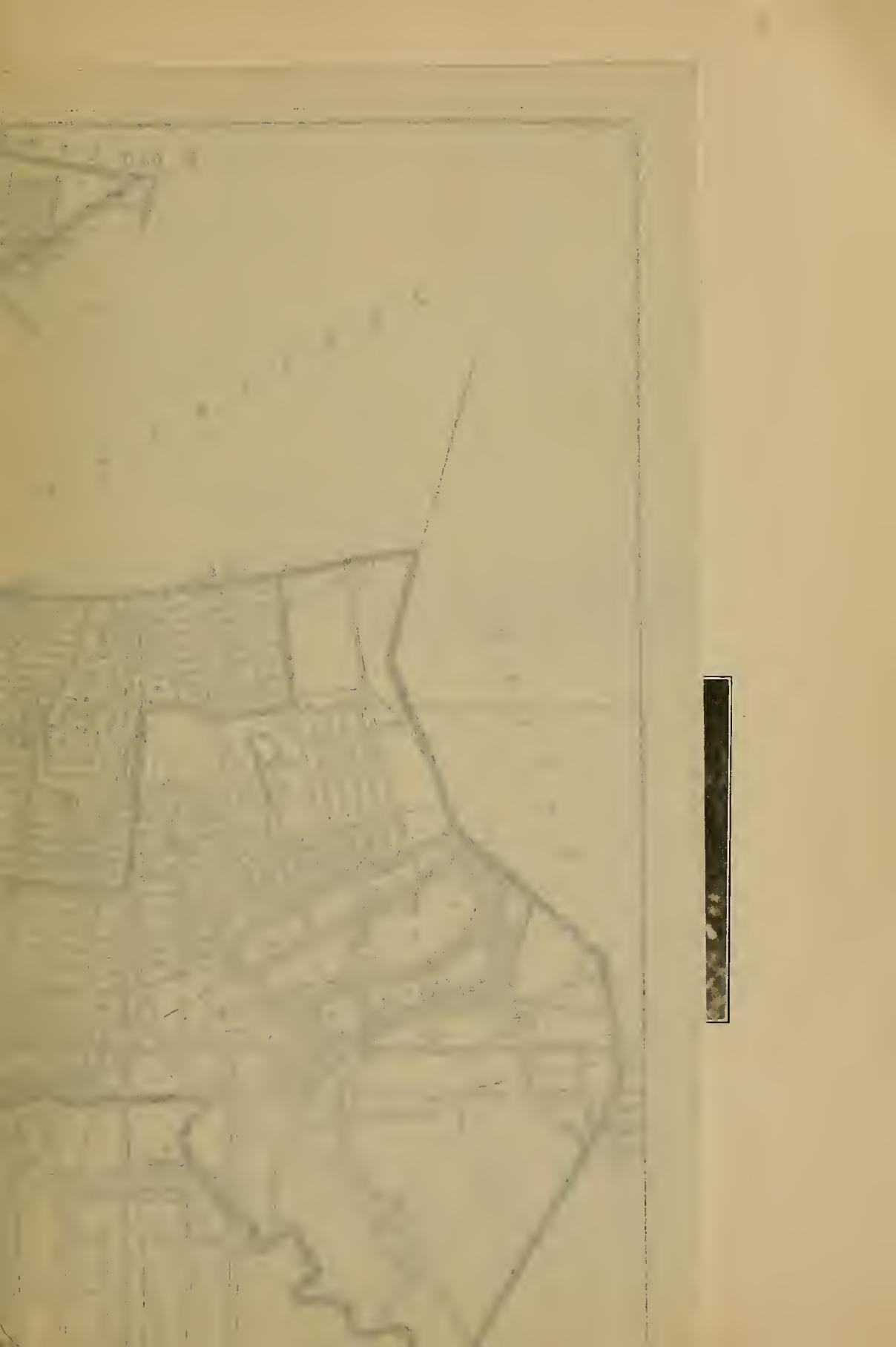
During the four summer months we had on record 509 cases, of which twelve died (including every case even though moribund or attending only a few hours. This gives a mortality of 2.3 per cent. If we omit two cases that were moribund and died after making only one visit, and one a breast-fed baby that died from *status lymphaticus*, our mortality is 1.9 per cent.

Of all the cases under one month on admission (9 per cent. of the total) none were in very poor condition. Of all under two months (22 per cent. of the total) none were in very poor condition. No babies that were entirely breast fed were in very poor condition. Of the babies in very poor condition 81 per cent. had been artificially fed, 12 per cent. partially breast fed, 7 per cent. on general diet. Among the Italian mothers in our care at one station 98 per cent. had been delivered by midwives, and 19 per cent. of all their babes born died before two years of age.

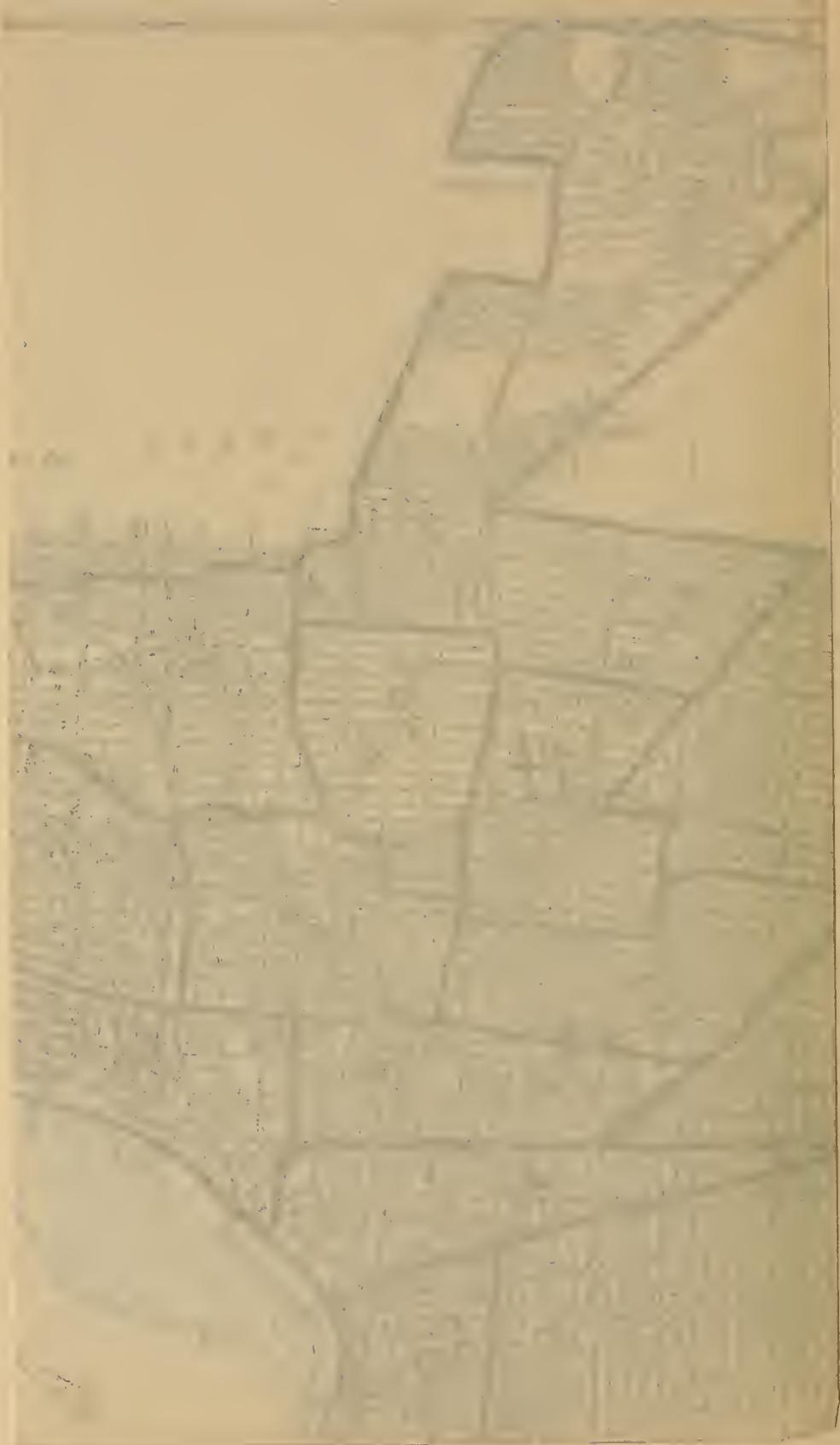
Department of
Child Hygiene
an asset to the
community.

I believe we are justified in the following conclusions: A high infant mortality rate is of grave moment not only on account of the pain, suffering, worry, and economic loss it entails, but particularly because it is an evidence of the ante-natal, neo-natal and post-natal environments to which those that survive are also exposed. The physical resistance and mental capacity of childhood, the moral stamina of adolescents, are directly influenced by the health and nutrition of the first two years of life. If we believe that the most valuable asset of this community is the health and character of its youth, we cannot longer question the urgency of making the conservation of infant life a special function of our municipality in a department of child hygiene in the city, county or state.









Our Problem



BORN WITH A HANDICAP.



IMPROPERLY CARED FOR AFTER BIRTH.

THE EXPERIMENT.

A statement of the work carried on by the Committee during the summer of 1912.

Infant Consultation Stations—

147 Seventh Avenue—Fifteenth Ward.	
226 Hunterdon Street (closed Oct. 1st), Fourteenth Ward.	
Beth Israel Hospital—Third Ward.	
Ferry and Richards Streets (open only one month), Tenth Ward.	
Number babies visited from birth records before one month old..	497
Number babies visited from birth records over 1 month and under	
2 months	200
Average gain per week of babies artificially fed on home modified	
milk	4 oz.
Number of babies registered at clinics.....	509
Number of babies died.....	12
Mortality rate	2.3%
Mortality rate, omitting babies under observation less than two	
weeks (7)	0.9%
Mortality among children under 2 years of age, of same mothers,	
prior to opening of clinic.....	13.9
Number of visits to clinics.....	1,549
Largest number attending clinic any one day.....	40
Average attendance	15
Number days by physicians at clinics.....	96

The clinics are held twice a week at each station.

The nurses connected with each station are of the same nationality as the people of the district and speak their language.

The doctors, to a considerable extent, also speak the language of the people.

NURSES.

Number of nurses—one head nurse, three in field: two speak Italian, one speaks Polish and Yiddish, Slavic and Russian.

Visits to homes for registered babies.....	3,033
Visits to homes for new born babies.....	697
Visits to homes for instruction in home modification of milk.....	766
.....	
Total	4,496

Average visits per nurse per field working day (6 working hours)	12
Average visits for each baby.....	6
Total working days.....	252

Divided as follows:

Days spent in visiting.....	141
Hours spent in clinics, 440, or days.....	55
Hours spent at stations (1 hour daily).....	28
Hours spent at lunch (1 hour daily).....	28

Number of babies registered at each station, from June 10 to Oct. 1:

	Total.	Under care Oct. 1st.
147 Seventh Avenue.....	208	168
226 Hunterdon Street.....	154	119
Beth Israel Hospital.....	127	122 began July 15th
Ferry and Richards Streets....	20	0 one month only.

From published reports about 500 babies are cared for by other agencies. This is about 5 per cent. of the total births. In New York in 1911 about 50 per cent. of the total births were under supervision. Of the 10,000 babies born each year in Newark, at least 3,000 babies ought to be under supervision.

MILK.

On account of the quality of the general milk supply and the price of certified milk in Newark, it was necessary, by special arrangement, to obtain milk both fit for infants and reasonable in price.

All milk used was kept under observation by the Board of Health and was bought by the mothers themselves from delivery wagons or from drug stores, at nine cents a quart. This milk is sold regularly at twelve cents and fourteen cents a quart, and had a bacterial count from 10,000 to 30,000 per C. C.

This arrangement was made only in the districts where our stations are located, but many mothers, who did not attend the stations, bought the milk.

Number bottles sold from drug stores, 23,023, equal to 161,161 feedings
Number bottles delivered to house, 4,947, equal to 34,629 feedings

	Total,	27,970	"	"	195,790	"
Number drug stores assisting.....					14	
Largest number quarts sold in one week.....					1,168	
Average number quarts sold per day.....					138	
Largest number from one drug store per day.....					17	

This method of supplying clean tuberculin-tested milk at a reasonable price can be quickly applied everywhere no matter what the character of the general milk supply may be.

It brings the best milk quickly and surely where most needed, without charity or special private effort. In this way every baby can receive pure milk.

MATERNAL NURSING.

Relation of method of feeding to condition of babies.

	Good %	Fair %	Poor %	Very Poor %
Breast	87	11	2	0
Partially breast	67	24	7	2
Artificial	42	31	14	13

Nursing infants rarely suffer from malnutrition or from any other diseases during the first year.

Relation of method of feeding to Diarrhea.

	Diarrhea	
	Present	Absent
Breast fed only.....	25%	75%
Partly breast fed.....	54%	46%
Artificially fed	51%	49%

Diarrhea is present in a large number of breast fed babies on account of too frequent feeding and improper handling.

Diarrhea was present in more than one-half of those partially breast fed, on account of too frequent feeding and over feeding. Even mothers who nurse their infants require advice and instruction.

Reports from Birmingham, England, for 1909, showed that of 1,242 babies that died from diarrhea only ten per cent. were breast fed.

Babies fed otherwise than on the breast die from diarrhea at twenty-seven times the rate that breast fed babies die.

The true solution of infant mortality lies in breast feeding, plus supervision. Society cannot afford to permit industrial, social, or economic conditions to prevent maternal nursing.

PROPORTION AT CERTAIN AGES THAT ARE BREAST FED, PARTLY BREAST FED OR ARTIFICIALLY FED.

Relation of age to method of feeding.

Age.	Breast	Partly	Artificially
1 to 4 weeks	85%	10%	5%
5 to 8 weeks	71%	23%	6%
9 to 12 weeks	68%	14%	18%
13 to 24 weeks	50%	29%	21%
24 to 52 weeks	10%	46%	44%

This gives the feeding as it existed, when the babies came to the consultation station.

Even at one month 10 per cent. were partly artificially fed, and 5 per cent. entirely artificially fed.

At two months 23 per cent. were already receiving the bottle in part, and 6 per cent. entirely.

This is, practically speaking, entirely preventable, as can be seen from figures gathered by Dr. Herman Schwartz, director of the Pediatric Department of Dr. Hill's Maternity Clinic, New York. Of 1,500 mothers he found only four who could not nurse, when encouraged by proper care and advice at and after the confinement.

Of these 1,500 mothers.	Of our 509 mothers.
96.9% nursed 1 mo.	95% nursed 1 mo.
89.1% " 3 "	81% " 3 "
77% " 6 "	79% " 6 "

Notwithstanding many statements to the contrary practically all mothers can nurse their babies.

He further shows the effect of careful supervision from birth on maternal nursing.

Of 44 mothers who nursed a previous child 0 months:

10	nursed the child under clinic care 8 months
9	nursed the child under clinic care 6 months
5	nursed the child under clinic care 5 months
4	nursed the child under clinic care 4 months
9	nursed the child under clinic care 3 months
4	nursed the child under clinic care 2 months
3	nursed the child under clinic care 1 month

In the Public Welfare clinics we succeeded in inducing mothers, who were giving the bottle only, to partly nurse, and many that were partly nursing to breast feed only. But to accomplish all that is possible in this direction we must see the babies in the first week and the mothers before the babies are born. This is the most important work, from every point of view, for the welfare of babies and the reduction of infant mortality. It requires much prompter return of birth records, and makes it desirable that the vital statistics be in the hands of those whose duty it is to conserve infant life. This is not the case in Newark to-day.

INFANT CONSULTATION STATIONS *vs.* MILK DEPOTS.

The efficiency of stations is determined by the age of babies attending. Of the babies registered at the Infant Consultation Stations 9 per cent. were under one month of age and 22 per cent. under two months. Most babies attending milk depots are over three months of age. Only 14 per cent. of the babies attending the New York Milk Committee milk depots were under two months. Since one-half of the babies dying in the first year die before three months of age, it is clear that not much can be accomplished unless they are reached soon after birth.

RELATION OF AGE TO CONDITION.

Age	Good	Fair	Poor	Very poor
	%	%	%	%
1 to 4 weeks.....	87	9	4	0
5 to 8 weeks	78	18	4	0
9 to 12 weeks	84	2.3	9	4.7
13 to 18 weeks.....	83	3	8	6
19 to 24 weeks.....	74	11	11	4
25 to 36 weeks.....	64	26	2	8
37 to 52 weeks.....	65	26	7	2
52 weeks	51	38	5	6

In the first two months, 82 per cent. were in good condition, none in very poor condition.

Between two and six months, 72 per cent. were in good condition, 5 per cent. in very poor condition.

The figures point to the importance of prompt supervision from birth and of the desirability of a prompt notification act so the babies can be visited soon after birth. In this way only can we prevent early weaning, improper feeding, summer diarrhea and malnutrition. To accomplish this the birth records must be, in fact, as supposed to be in law, in the hands of those requiring them within five days after birth.

MORTALITY RECORD OF CHILDREN UNDER TWO YEARS OF AGE PREVIOUS TO MOTHERS' ATTENDANCE AT CONSULTATION STATIONS AND PRO- PORTION DELIVERED BY MIDWIVES.

	Mothers	Births	Deaths under years of age	Mor- tality rate	Delivered by midwife
Seventh Avenue (Italian).....	206	476	95	19%	98%
Hunterdon Street (Italian and mixed)	154	468	55	12%	91%
Beth Israel Hospital.....	126	363	37	10%	56%
Ferry Street (Slavic).....	19	61	11	18%	74%

The highest mortality was found among the Italians in the Fifteenth ward. Here, almost all the women are confined by midwives. Practically all of these carry on factory labor in the home. Most of those under our observation know very little of infant hygiene and the general rules of health.

Of all the babies born to the 509 mothers before they attended the clinics thirteen per cent. died before reaching their second birthday. Of the same mothers only 2.3 per cent. of the babies under the care of the infant consultation stations died during the summer. Supervision alone causes a reduction in infant morbidity and mortality.

ALL MOTHERS CAN BE TAUGHT TO MODIFY MILK AT HOME.



DATA CONCERNING THE TWELVE FATAL CASES.

If we omit the two cases of syphilis and one case of Status Lymphaticus, all clearly beyond our influence, our mortality was 1.9%. If we omit, in addition, all cases that were under our care less than four days, the mortality is reduced to 1.1%. If we omit those under observation less than nine days, the rate would be 0.9%.

Of the twelve fatal cases, only one at the outset of summer was breast fed and in good condition. This infant died from an irremediable, inherent defect.

Of the remaining eleven, three were in fair condition and eight in poor or very poor condition, and before the hot weather had set in were from ten per cent. to fifty per cent. under weight. Two had been artificially fed from birth and eleven had been artificially fed after the first month.

Four of the twelve that died were without mother's care; of these two were legitimate and two illegitimate. Of the former, one mother died and one worked in a factory; of the latter, one mother deserted and one worked in a factory.

The above facts show clearly that many factors other than milk and summer heat bring about the death of infants. These factors can be classed as social and economic rather than hygienic and sanitary. Furthermore, they prove that babies dying from summer diarrhea have been suffering from improper care and feeding before the summer began. Therefore, work must be conducted all year around and not during the summer alone.

Above all, these cases show that for one reason or another, personal, social or economic, the babies were deprived of the breast and often of the mother's care as well. When this takes place the legitimate baby fares no better than the illegitimate baby.

Of these twelve cases eleven could have been saved, first, by prevention or prompt cure of hereditary syphilis; second, by active supervision of the babies immediately after birth so that they would have been nursed and properly cared for; third, by the keeping of mother and baby together, whether legitimate or illegitimate.

EXPENSES JUNE TO OCTOBER, 1912.

Salaries of head nurse and two nurses.....	\$860.00
One nurse is paid by the Board of Health. (\$65.00 per month.)	
Expenses of nurses for sundries.....	30.39
Signs, index cards, charts.....	66.00
Furnishing of three Stations.....	24.00
Literature distributed	27.85
Equipment of Stations—scales, repairs, etc.....	20.25
	<hr/>
	\$1,028.49

Owing to the hospitality of churches in the clinic neighborhoods, there was no expense for rent.

Omitting the salary of the head nurse, the cost per baby, for the time actually devoted to it alone would be \$1.10 for four months, or \$0.0130 per baby per day for nurse.

Costs about \$4.00 a year to keep a baby alive and well.

Costs about \$50.00 to bury it.

HISTORY OF FATAL CASES.

Number of Case.	Age in Weeks.	Date of Registration.	Condition when Regis- tered.	Date of Death.	Cause of Death.	Condition at Death.	Character of Death.	Delivery of Labor.	Character of Death.	No. Children Died.	No. Children Born.	Disease of Parents.	Mother.	Father.		
1 27	Aug. 14	Aug. 22	Male	Very Poor	Bottle	2 months	Absent	50%	Poor	Aatrophy	Midwife	Normal	6	0	41	41
2 36	Aug. 23	Aug. 27	Male	Moribund	Bottle	2 months	Absent	50%	Very Poor	Atrophy	Midwife	Normal	1	0	20	30
3 45	July 30	Aug. 1	Male	Moribund	Bottle	2 weeks	Absent	42%	Poor	Atrophy	Midwife	Normal	8	0	36	28
4 27	June 7	Sept. 25	Male	Fair	Bottle	Absent	Slight	13%	Fair	Atrophy	Midwife	Normal	6	1	32	32
5 52	Sept. 14	Oct. 9	Female	Fair	Bottle	2 months	Absent	25%	Fair	Diarrhea	Midwife	Normal	3	1	28	29
6 60	Aug. 10	Sept. 4	Male	Poor	Bottle	2 months	Absent	47%	Poor	Pneumonia	Midwife	Normal	1	0	21	23
7 3	July 12	Aug. 5	Male	Very Poor	Breast	Absent	Slight	42%	Very Poor	Syphilis	Midwife	Normal	2	2	23	24
8 44	Aug. 23	Aug. 26	Female	Very Poor	Bottle	2 months	Absent	15%	Fair	Diarrhea	Physician	Normal	4	1	27	28
9 2	July 5	July 9	Male	Poor	Bottle	1 week	Present	None	Poor	Syphilis	Midwife	Normal	Foundling	—	—	—
10 22	July 5	July 14	Female	Very Poor	Bottle	2 weeks	Absent	50%	Very Poor	Atrophy	Midwife	Normal	4	0	40	50
11 9	Aug. 3	Sept. 8	Female	Poor	Bottle	Slight	Absent	10%	Poor	Diarrhea	Midwife	Normal	6	1	38	38
12 22	July 27	July 29	Female	Very Good	Breast	1 week	Present	Overweight	Very Good	Status Lymphaticus	Midwife	Normal	6	1	39	48

STUDY.
STATEMENT OF THE PROBLEM OF INFANT MORTALITY
IN NEWARK AND ESSEX COUNTY.

TABLE 1.

Number of deaths under one year for period 1901-1910 and in 1910.

	1910	1901-1910
Newark	1,232	10,703
Orange	100	1,030
Montclair	94	843
East Orange	45	422
Belleville	41	250
Bloomfield	26	319
Irvington	26	177
West Orange.....	24	189
Essex County.....	1,631	14,457

TABLE 2.

INFANT MORTALITY RATES:

PROPORTION OF DEATHS UNDER 1 YEAR OF AGE TO 1,000
BIRTHS.

	1910	1901-1905	1905-1910
Newark	123	155	130
Orange	119	156	126
Montclair	200	305	161
East Orange	75	110	87
Belleville	220	...
Bloomfield	90	190	132
Irvington	111	127	107
West Orange	96	119	92
Essex County	121	157	128
Essex County (less 8 cities)...	...	100	...

TABLE 3.

PROPORTION OF DEATHS UNDER ONE YEAR TO TOTAL
DEATHS.

	%		%
Newark	20.3	Belleville	—
Orange	20.0	Bloomfield	21.4
Montclair (Infant asylum present)	30.9	Irvington	18.5
East Orange	15.4	West Orange.....	20.0
		Essex County.....	—

TABLE 4.

PROPORTION OF DEATHS UNDER ONE MONTH TO DEATHS
UNDER ONE YEAR.

	%		%
Newark	33.2	Bloomfield	32.9
Orange	34.7	Irvington	33.3
Montclair	23.3	West Orange.....	35.9
East Orange.....	41.9	Essex County.....	33.7
Belleville	36.4	Essex County (less 8 cities) (Rural)	40.3

TABLE 5.

INFANT MORTALITY IS THE HEALTH PROBLEM OF
GREATEST MAGNITUDE IN ESSEX COUNTY.

Year 1910	Infants	Tuberculosis
Essex County	1,631	1,122
Newark	1,232	831

The number of deaths from tuberculosis at all ages and in all forms is less than the number of deaths among infants under one year of age.

These tables show the great number of infants that die before they reach the age of one year. It exceeds all deaths from tuberculosis in all forms at all ages. It forms approximately one-fifth of the total number of deaths. In most cities one-third of all deaths under one year occur in the first month of life.

In cities where infant mortality is low it will be found that it can be further reduced by attacking the factors influencing death in the first month.

In East Orange 41 per cent. of deaths under one year of age are due to deaths under one month.

It is the unanimous opinion that at least 50 per cent. of the deaths under one year are preventable. The preventable deaths represent conditions in which the surviving infants must continue to live. Many die in the second or third year, others carry their malnutrition and physical defects into school, industrial and family life. A conservative estimate can place this preventable loss in life, health, and general efficiency in the County of Essex alone at \$100,000 a year.

INFANT MORTALITY RATE IN NEWARK, 1901-10.

Deaths under one year per 1,000 births.

Year	Total Rate	CERTAIN GROUPS OF DISEASES			All Others
		Respiratory	Gastro Intestinal	Congenital Debility	
1901	160
1902	163	30.3	29.1	38.7	64.7
1903	151	24.6	30.0	48.2	48.2
1904	162	27.9	43.6	38.6	51.9
1905	141	22.9	43.4	40.2	28.5
1906	143	28.8	46.7	46.3	21.2
1907	138	18.5	43.1	40.5	37.9
1908	133	23.3	55.5	38.6	26.6
1909	115	19.9	34.4	38.8	21.9
1910	123	25.4	34.4	34.0	29.1
Average { 1902-05	26.4	36.5	41.4	48.3	37.3
1906-10	23.1	40.6	39.6	37.3	37.3

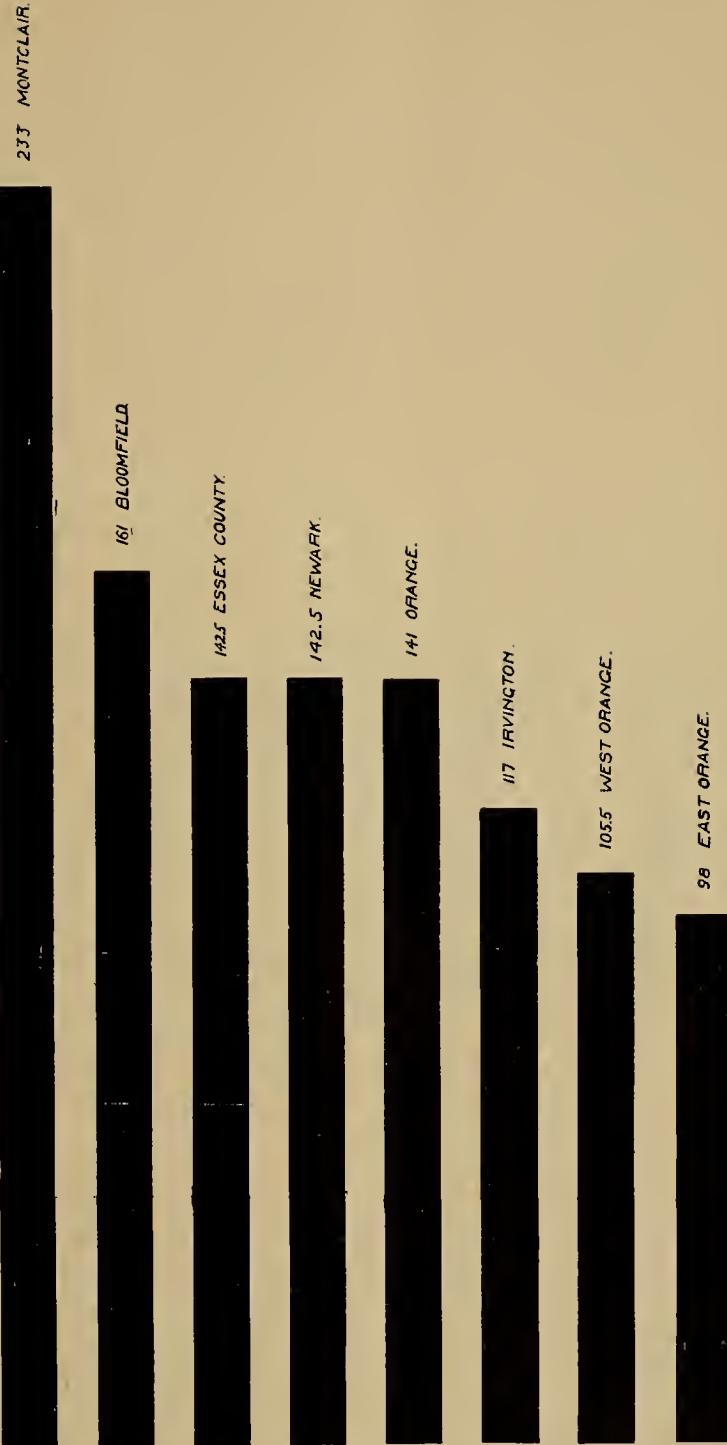
There has been a positive reduction in infant mortality in Newark in the past ten years. What has caused it?

PROPORTION OF DEATHS UNDER ONE YEAR DUE TO DEATHS FROM DIARRHEA.

1902.....	17.5	average 18.6	1906.....	37.3	average 37.5
1903.....	19.7		1907.....	39.7	
1904.....	25.7	average 27.2	1908.....	32.4	average 30.1
1905.....	28.7		1909.....	30.0	
1910..... 28.0					

CHART II.

INFANT MORTALITY IN ESSEX COUNTY



COMPARATIVE DEATH RATES OF CHILDREN UNDER ONE YEAR TO 1000 BIRTHS 1901-1910.

The tables show that the proportion of deaths under one year due to diarrhea have increased 46.2 per cent. in 1904-5 over 1902-3, 101.5 per cent. in 1906-7 over 1902-3, 61 per cent. in 1908-10 over 1902-3.

That the reduction of infant mortality in Newark has been due to a reduction in the number of deaths from those diseases other than those classed under respiratory, gastro-intestinal, and congenital debility; namely, to the acute contagious diseases, meningitis, tuberculosis, syphilis, convulsions, diseases of the heart and kidneys, which showed a rate of 29.1 in 1910 against 64.7 in 1902.

In the period 1906-10 there was an actual increase in the deaths due to diarrhea over 1902-06. There has been a very slight decrease in those due to congenital debility and respiratory diseases.

While there has been a reduction in Newark in the infant mortality rates, it is clearly not due to the activities established in Newark with the hope of influencing deaths from contaminated milk and summer diarrhea. In truth there has been an actual increase in deaths due to diarrhea.

THE AGE OF THE INFANT IS OF FAR GREATER IMPORTANCE THAN THE QUESTION OF SUMMER HEAT OR SUMMER DIARRHEA.

Newark, 1910.

Total number of deaths under 1 year of age	Number of deaths during June, July, Aug., Sept.	Proportion of deaths during Summer	Number and proportion of deaths under 3 mos. of age to deaths under one year
1242	497	40%	660; 53.1%

During the summer period of four months, that is one-third of the year, 40 per cent. of the babies died, while during the first three months of life, that is one-fourth of the first year, more than 50 per cent. of the babies died.

Age Incidence of deaths in the first year.....

Total number of deaths under:

1 day	1 week	1 month	2 months	3 months	1 year
140	285	456	560	660	1242

Of the deaths under one year, 11.2 per cent. occur on the first day, 22.9 per cent. in the first week, 36.7 per cent. in the first month, 45 per cent. in the first two months, 53.1 per cent. in the first three months.

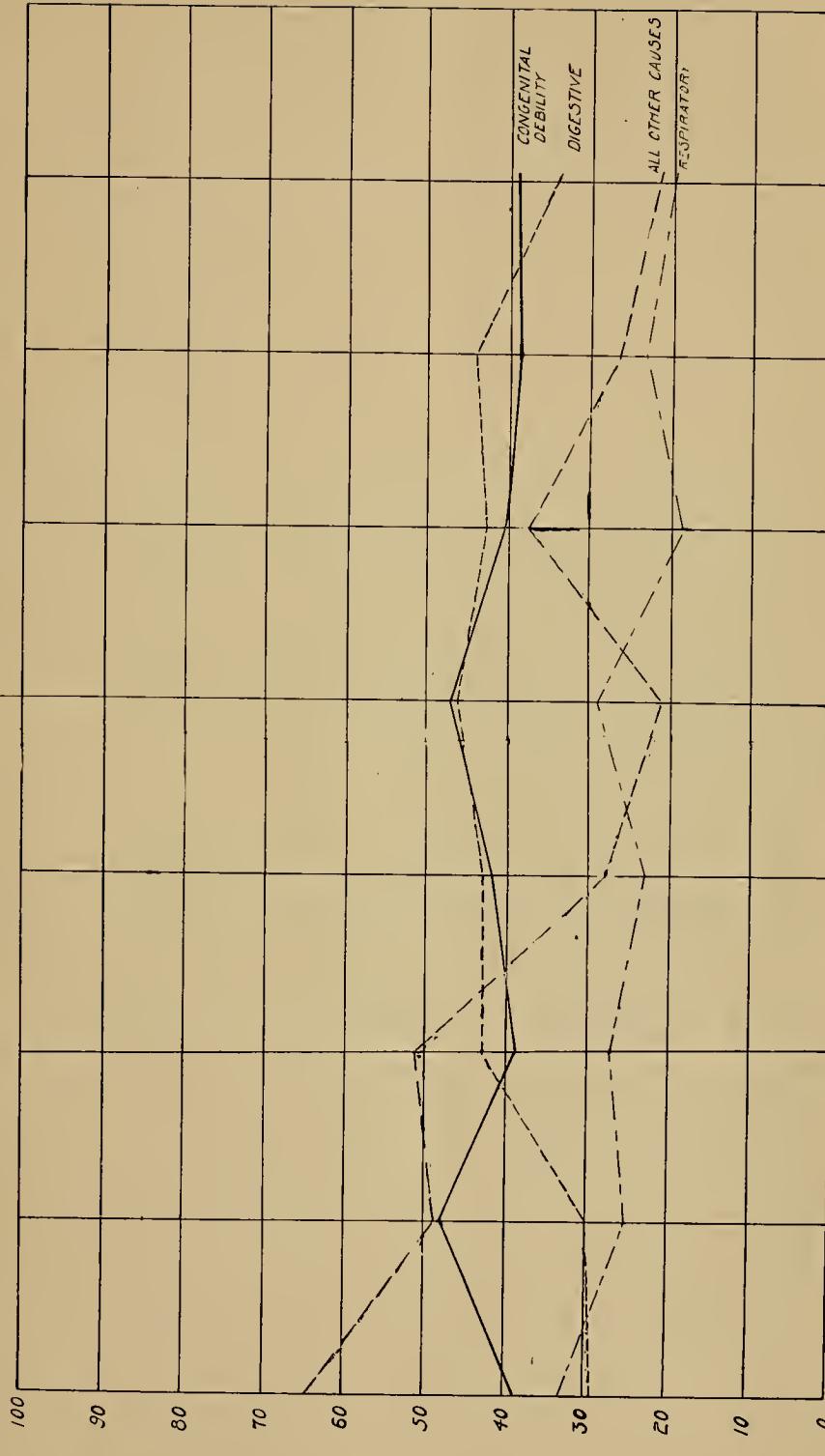
Of the deaths in the first month, 36.7 per cent. of the total under one year, only 6 per cent. are ascribed to diarrhea.

These tables clearly direct our attention to conditions affecting infant life and death, acting before, at, or immediately after the birth.

Contaminated milk and summer diarrhea are not the most important factors in infant mortality.

CHART VII. DEATH RATES FROM THE MAIN CAUSES OF INFANT DEATHS
NEWARK, 1902-1909.

PER 1000 BIRTHS.



NOTE. Marked decrease in deaths due to "all other causes," 1902-1903. Decrease in infant death rate not due to digestive causes, 1902-1903.

The infant mortality is not evenly distributed through the first year.
Newark, 1910.

PROPORTION OF DEATHS AT CERTAIN AGES PER 1,000
BABIES OF SAME AGE.

Under 1 week..	28.4	Under 1 month.	45.4	Under 1 year...	123
First day.....	13.9	First week.....	7.29	One month.....	10.8
Second day.....	5.05	Second week...	5.48	Two months....	10.5
Third day.....	2.74	Third week.....	4.88	Three months...	9.6
Fourth day.....	2.64			Four months...	7.97
Fifth day.....	1.92			Five months....	8.8
Sixth day.....	1.14			Six months....	7.5
Seventh day....	1.22			Seven months...	6.07
				Eight months...	7.0
				Nine months....	6.6
				Ten months....	5.2
				Eleven months..	4.7

The greatest infant mortality is on the first day. It steadily decreases to the end of the year. As many deaths occur in the first week as in the second, third and fourth months combined. Almost as many deaths occur on the first day as in the last three months of the first year combined. As many deaths occur in the first month as in the next five months combined.

Any plan that would reach the babies at their most critical period must control the conditions that cause the high infant mortality in the first days, namely, the health of the mothers, diseases of parents, lying-in care, maternal nursing.

Prenatal and neonatal care are probably equally important with post-natal care, and can be made equally effective.

EFFECT OF CARE OF THE FOUNDLING, DEPENDENT AND
MOTHERLESS INFANTS ON INFANT MORTALITY.

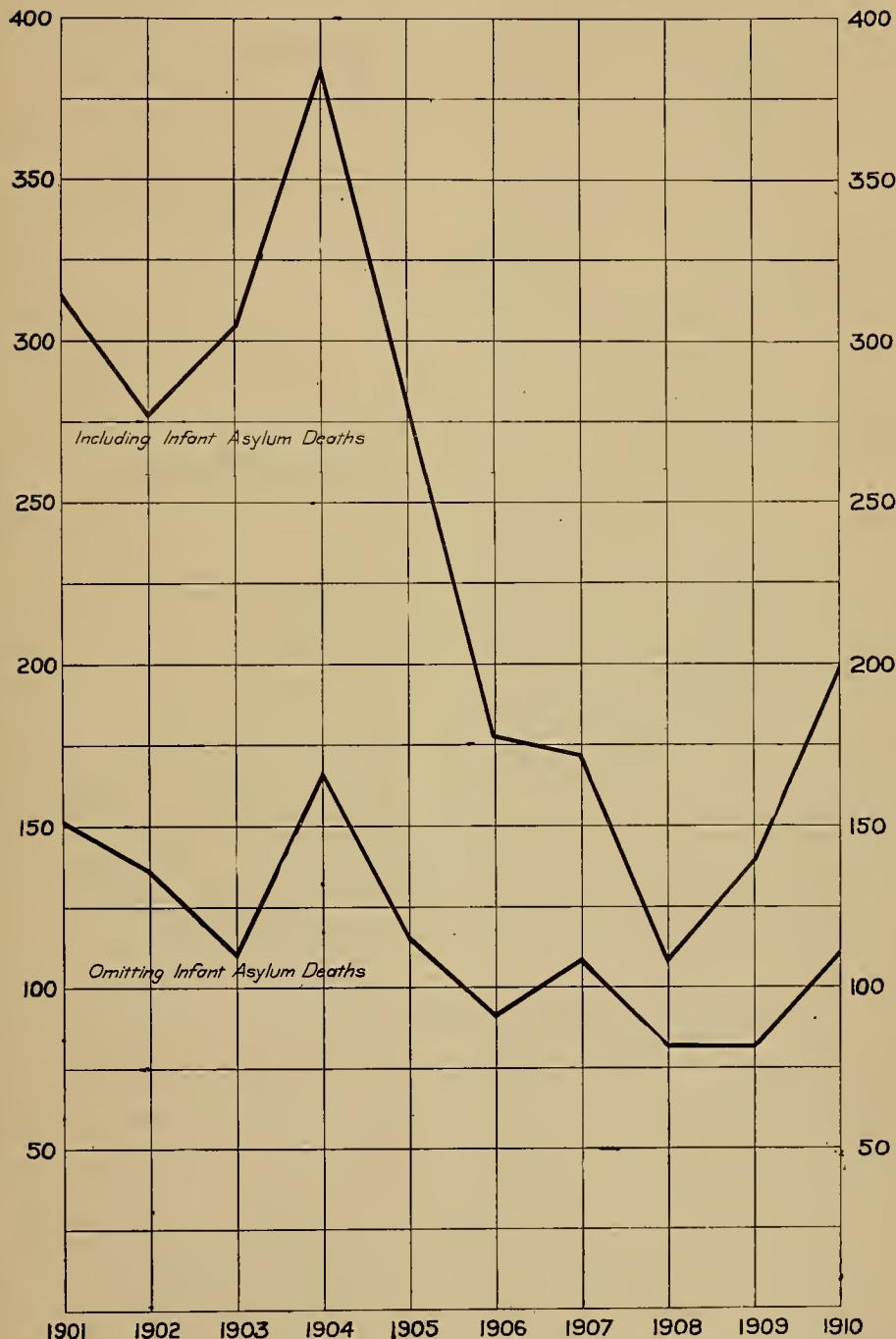
*INFANT MORTALITY IN INFANT ASYLUM (MONTCLAIR).

Years	Infants under 1 year		Mortality rate per 1000 admissions
	Admitted	Died	
1901	67	43	640
1902	80	60	750
1903	101	73	720
1904	89	65	730
1905	84	57	670
1906	51	32	620
1907	38	28	730
1908	8	6	750
1909	56	27	480
1910	51	35	680
1911	56	26	460

Average for ten years,
68 per cent. of all babies
admitted under one year
died before reaching their
first birthday.

*Figures furnished by Health Officer of Montclair.

INFLUENCE OF INFANT ASYLUM ON INFANT MORTALITY
RATE OF MONTCLAIR, N. J.
1901—1910



INFLUENCE OF INFANT ASYLUM ON THE INFANT MORTALITY RATE OF A CITY (MONTCLAIR).

Infant mortality rate in Montclair, with deaths in Infant Asylum.

	Included	Omitted
1901.....	315 per 1,000 births.....	152
1902.....	278 " " " 	137
1903.....	305 " " " 	111
1904.....	385 " " " 	167
1905.....	282 " " " 	116
1906.....	178 " " " 	92
1907.....	173 " " " 	109
1908.....	109 " " " 	82
1909.....	140 " " " 	82
1910.....	200 " " " 	111

Average infant mortality rate for ten-year period in Newark, 142.9; Infant Asylum in Montclair, 680.

INFLUENCE OF FARMING OUT BABIES ON INFANT MORTALITY, NEWARK, SUMMER OF 1910.

Number of deaths under one year of age in Sixteenth ward, 13; baby farm in same ward, 6.

During the summer of 1910 of all the babies under one year of age that died in the Sixteenth ward, 46 per cent. died in a home that was receiving babies for board.

In Montclair in some years 60 per cent. of all deaths under one year occur in an infant asylum.

In London in the Foundling Hospital the mortality of children under five years at one time was 69 per cent. Now the children of the same class are placed out until five years of age, and so in 1910, out of 260 children boarded out in private homes only four died.

In New York, 42 per cent. of all the deaths under one year occurred in hospitals and institutions. In one foundling institution, out of 2,440 births and admissions, 1,275, or 52 per cent., died before reaching one year of age.

From the above figures one must conclude that infant asylums, hospitals and baby farms are not good places for babies.

Mr. Claude Wright, the general secretary of Dr. Bernado's Homes, which is the largest charity in England dealing with infants, says: "Our experience leads us to the conclusion that a large segregation of babies under one roof is fatal to their well-being and health, however carefully and well they may be looked after. Therefore, all babies that come under our care are boarded out immediately."

Dr. S. Josephine Baker, chief of Department Child Hygiene, New York, says: "While it is recognized that many of the babies received at these institutions are in poor physical condition and often even moribund, yet investigations have shown that it is possible to greatly reduce the mortality among this class of babies if they can be placed out to board in properly inspected and supervised private homes."

HOUSING AND CONGESTION.

Housing and congestion must have a marked effect on health. It has been an accepted fact that the highest infant mortality was found in the most congested districts of a city. Recently it has been shown that during the summer the infant mortality is very much influenced by the temperature, moisture, and ventilation of the living rooms; it was found in Berlin that the mortality of babies living in the upper floors of tenements was higher than of those living lower down. It is interesting to note that in Newark the greatest density and congestion is found in the wards showing the greatest infant mortality.

Newark, 1910.

Wards	Number of persons to occupied area :	Number of persons to dwelling.
14	126	10.47
3	123	11.83
15	98	9.08
5	86	9.17
Whole city	40	8.09

These are the wards where the greatest number of babies die in the city of Newark. Here is the greatest need for "breathing spaces," little bits of parks, so that the babies can be taken out of the superheated tenements during the summer. Here is where the tenement house laws need to be enforced most vigorously.

MIDWIFERY.

Eighty-five midwives registered in Newark since 1895; 135 midwives were practicing in November, 1912.

Proportion of mothers delivered by midwives—

Newark.....52% Montclair.....13-18% Orange.....36%

Proportion of mothers delivered by midwives, by nativity—

Newark, 1912—summer.

Italian	83%	Russian	60%
Austrian	82%	German	48%
Hungarian	73%	Native	25%

Midwives are a very important factor for good or for evil in the early life of infancy, and should be carefully supervised by the authorities.

NUMBER OF HOSPITAL BEDS IN ESSEX COUNTY.

	For Maternity cases	For Children under three years of age
Newark	37	66
Orange	8	6
Montclair	4	—

Six per cent. of all babies born during the summer of 1912 were born in the hospitals of Newark. Very little lying-in facilities in the hospitals of Essex County. Midwives deliver most of the mothers where infant mortality is highest.

CHARACTER OF INFANT POPULATION BY NATIVITY OF MOTHERS.

Three thousand one hundred and thirty-five infants were born from June to October, 1912, in Newark, N. J.

NATIVITY OF MOTHERS.

833 Italian	26.0%	129 German	4.1%
333 Austrian	10.6%	1342 Native	42.0%
144 Hungarian	4.5%	176 English, Irish, Scottish	5.2%
452 Russian	14.0%	126 Miscellaneous	4.1%

While 47 per cent. of the babies were born of native, English, Irish and Scottish mothers, only 38% of the children dying under two years were of native, English, Irish and Scottish mothers.

Fifty-eight per cent. of babies born during the four months—June, July, August and September—have foreign-born mothers.

Less than 50 per cent. of the babies born in Newark have mothers whose native tongue is English.

Twenty-six per cent. have mothers who can be effectively educated in infant hygiene in Italian only.

Twenty-nine per cent. have mothers who can be effectively educated in infant hygiene in Polish, Russian or Yiddish only.

Since education is the very kernel of all effective plans for the reduction of infant mortality, it is apparent that if this work is to be done effectively in Newark we must have doctors and nurses who can speak the language of our various foreign elements. In work previously carried on here and elsewhere, this phase has not received the emphasis that it deserves.

CONCLUSIONS.

Infant consultation stations are less expensive and more efficient than milk depots.

All mothers can be taught to prepare milk for their infants at home.

Pure milk can be obtained for babies at a price within reach of all.

The mortality of infants under one year of age is exceedingly high in all institutions.

Infants deprived of mother's care should be placed out in properly supervised private homes.

Ignorance is the greatest single factor in infant mortality.

Education of mothers and the supervision of babies cause the greatest reduction of infant mortality.

The prompt and accurate notification of births is necessary to enable us to prevent the great mortality of the first week of life.

Midwives can become a great force in the education of our foreign born mothers in infant hygiene through active and careful supervision.

The reduction of infant mortality can best be accomplished by the establishment of a municipal department of child hygiene.

DEPARTMENT OF CHILD HYGIENE BY MUNICIPALITIES,
COUNTY OR STATE.

FUNCTIONS.

The functions of such a department should be:

- A. Care of new-born.
 - 1. Securing of all birth records within 5 days.
 - 2. Providing of pure milk for infants.
 - 3. Establishing infant consultation stations.
 - 4. Visiting of new-born.
 - 5. Education of mothers in the care of infants.
- B. Control and supervision of midwives.
- C. Registry for and supervision of placed out infants.
- D. Inspection of institutions harboring dependent children.

ARGUMENT.

Civilized society has accepted the responsibility of caring for the health of all its members. While in the beginning communities had to content themselves with the mere care and control of disease on account of ignorance of the fundamental etiological factors in disease, our health authorities at the present time are able and anxious to prevent those conditions that are known to lead to lower resistance, ill health, disease and general inefficiency. The prevention of disease is easier and cheaper than its treatment and cure.

No one condition, no one period of life is as important to the future health of the community as infancy. The health, vigor, industrial efficiency and moral stamina of our citizens are influenced by their early environment and care. The governments of Europe are deeply interested in their birth rates and infant mortality rates, and are spending much thought and money for child welfare, because, it is said, they need soldiers. I am sure we cannot afford to be less concerned, for we need, above all else, sane, healthy, well-balanced, efficient, self-supporting citizens.

Thousands upon thousands of dollars are spent for moral, secular, and industrial education for children who are unable to profit from it on account of physical and mental defects that result directly from improper and insufficient care during infancy. Absences from school, retardation and backwardness, classes for anemic and tubercular children, would all be considerably lessened by active supervision of children under school age.

While much has been accomplished by the present methods of controlling the spread of tuberculosis, the most brilliant results are to be expected from activities that will improve the nutrition and increase the resisting powers of the children.

Finally, modern society cannot knowingly and needlessly permit these little ones to suffer and to die, and remain true to its trust and responsibilities.

For these reasons we feel that it is the duty of the city and state to adopt some such plan as is outlined above, so that each infant will have a fair opportunity for life and happiness. The expense entailed should be looked upon as an investment that would repay the community many times in lives saved, sickness prevented, and a general increase in economic, educational and moral efficiency. The money for this department would, properly speaking, come from a redistribution of expenditures.

COST OF DEPARTMENT OF CHILD HYGIENE.

A department could be established in Newark for \$8,500. It would supervise the care of 3,000 infants. It would cost approximately three dollars a year to supervise the care of one baby.

The expenses would be distributed as follows:

Three	{	One Director	\$1,200
Physicians	{	Two physicians for stations.....	1,000
Six nurses			4,680
Six stations, in schools.....			
Printing			500
One clerk.....			750
Equipment			500
Incidentals			20
Total.....			\$8,500

Infant consultation stations are most urgently needed in the centre of the congested districts in the Fifth, Tenth, Twelfth, Fourteenth, Fifteenth and Third wards. They should be located near—

	Character of neighborhood
Seventh avenue and Factory street, in the Fifteenth ward.....	Italian
Fourteenth avenue and Newton street, in the Fourteenth ward....	Italian
Prince and West Kinney streets in the Third ward....	Russian and Polish
Pacific and Oliver streets, in the Twelfth ward.....	Italian
Adams and Downing streets, in the Fifth ward.....	Italian and Polish
Ferry and Richard streets, in the Tenth ward....	Polish, Russian, German

Of the six nurses, three should speak Italian and three Slavic languages. One doctor should speak Italian and one doctor Yiddish and Slavic.



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